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# *nDNet Hub*

## *User Manual*

*Version 1*

*5/5/2011*



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### *General Description:*

The n-DNet™ Hub is a standalone network interface unit connecting endpoints to the Mobix patented n-Dimensional Network (see box for n-DNet™ description) It is a feature rich Hub designed to collect, store and forward data from up to eight meters. Meters could be in any combination of electric, gas and/or water with Pulse, RS-232 or M-Bus outputs. A backup battery lasting up to seven years ensures data and operational integrity including last gasp message so critically important for outage management.

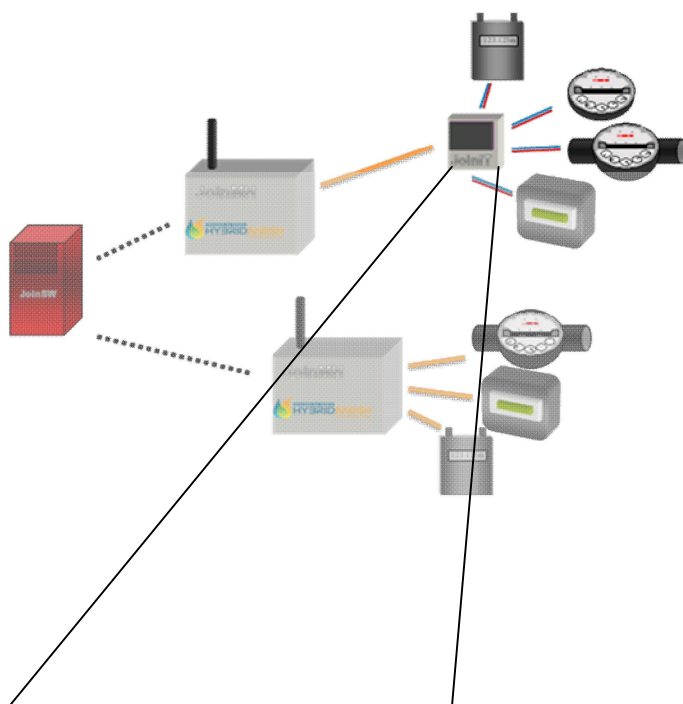
As a node on the patented n-Dimensional mesh network, the n-DNet™ Hub communicates simultaneously in parallel over RF and PLC there by guaranteeing continuous reliable two-way communications at the highest cost efficiency. System tempering detection, parameter driven abnormal consumption and remote service connect/disconnect are among the smart n-DNet™ Hub unique features.



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## The FlexIT in the AMR system Complex:





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|   |  |
|---|--|
| <p><b><u>Capabilities</u></b></p> <ul style="list-style-type: none"> <li>✓ Provides an interface for connection of existing meters to the n-DNet™ network.</li> <li>✓ Collects and stores readings from gas/water/ electricity meters in a non volatile memory</li> <li>✓ Core operation capabilities without external power for at least 48 hours</li> <li>✓ Optional control on up to 18 valves</li> <li>✓ Detects tampers on data cable</li> <li>✓ 3 LEDs for signaling on power status, TX and RX indication</li> </ul> | <p><b><u>Isolation</u></b></p> <p>The system has the following isolation features between the high input voltage and the LT-Bus cables:</p> <ul style="list-style-type: none"> <li>✓ A switching transformer</li> <li>✓ ESD filters on output wires</li> <li>✓ Varicaps for spike prevention</li> <li>✓ The cables will have a grounding line</li> </ul> |
| <p><b><u>RF standards</u></b></p> <ul style="list-style-type: none"> <li>✓ Complies with FCC,</li> <li>✓ Frequency 915 MHz</li> <li>✓ Sensitivity = -118dBm</li> <li>✓ Max Output Power 20dBm</li> </ul>  | <p><b><u>Interfaces</u></b></p> <ul style="list-style-type: none"> <li>✓ 4 pulse input ports</li> <li>✓ 4 cable status inputs</li> <li>✓ 4 output ports (for valve control)</li> <li>✓ 3 LED – TX, RX, Power</li> <li>✓ Pulse-out, RS-232, RS-485, M-Bus, ZigBee</li> </ul>  |
| <p><b><u>PLC standards</u></b></p> <ul style="list-style-type: none"> <li>✓ Complies with FCC regulations</li> <li>✓ 100-400KHz</li> </ul>  | <p><b><u>Environmental</u></b></p> <ul style="list-style-type: none"> <li>✓ -45°C to +80°C</li> <li>✓ Fully RoHS Compliant</li> </ul>  |
| <p><b><u>Power consumption</u></b></p> <ul style="list-style-type: none"> <li>✓ Input Voltage: 100-130Vac</li> <li>✓ Operation voltage: 5Vdc</li> <li>✓ Idle: 5V, 100mA</li> <li>✓ In transmission: 500mA</li> </ul>  | <p><b><u>Network Security</u></b></p> <ul style="list-style-type: none"> <li>✓ Message authentication</li> <li>✓ Unit ID authentication</li> <li>✓ Password protection (e.g., disconnect command)</li> </ul>   |
| <p><b><u>Dimensions</u></b></p> <ul style="list-style-type: none"> <li>✓ size : 17x12x6.5 cm</li> <li>✓ For external box drawings see previous page</li> </ul>  |  |

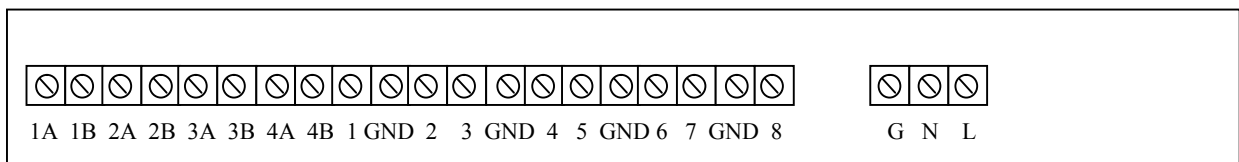


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## Installation

1. Bolt the unit to the wall using the two mounting points in the two corners of the box, or mount on a DIN rail using the dedicated DIN mounting on the back of the box.
  2. Connect the 20 control wires to the bottom pitches according to the pin numbers. Use the designated screws.
- This is a view of the wire connections of the Hub:



According to the scheme of connection:

- I. Meter pulse output wires (1, GND, 2, 3, GND, 4, 5, GND, 6, 7, GND, 8)
  - The number indicates the meter's number
  - Each two meters have a joint ground connection
    - Connect the (+) wire to the numbered input
    - Connect two (-) wires to the joint GND connector
- II. Valve control (1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B)
  - The number indicates the controlled valve number.
  - The letter indicates which of the valve's wires should be connected to the designated port:
    - A- first wire (-) of the valve control wires
    - B- second wire (+) of the valve control wires

(see **Appendix 3**)

3. Connect the power supply cable to a 220/110Vac power source.



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### Safety

1. Connect the input and output wires only when mains are not connected
2. Connect mains only to 100-130Vac power source
3. All AC connections should be done by an authorized electrician

### The FCC Wants You to Know

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- a) Reorient or relocate the receiving antenna.
- b) Increase the separation between the equipment and receiver.
- c) Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- d) Consult the dealer or an experienced radio/TV technician.

| FCC Warning  |
|--|
| A distance of at least 20cm. between the equipment and all persons should be maintained during the operation of the equipment.   |
| Modifications not expressly approved by the manufacturer could void the user authority to operate the equipment under FCC Rules. |

NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

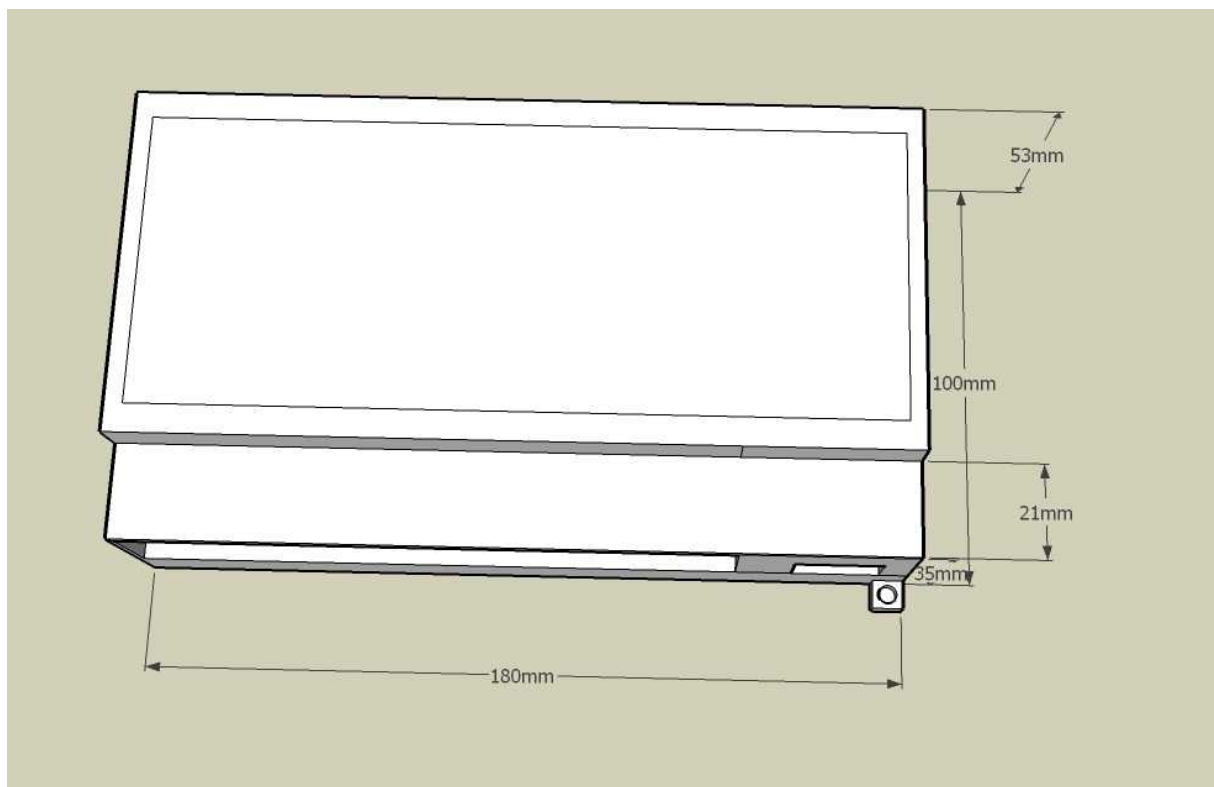


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#### 4. Appendix 1

#### Hub external box



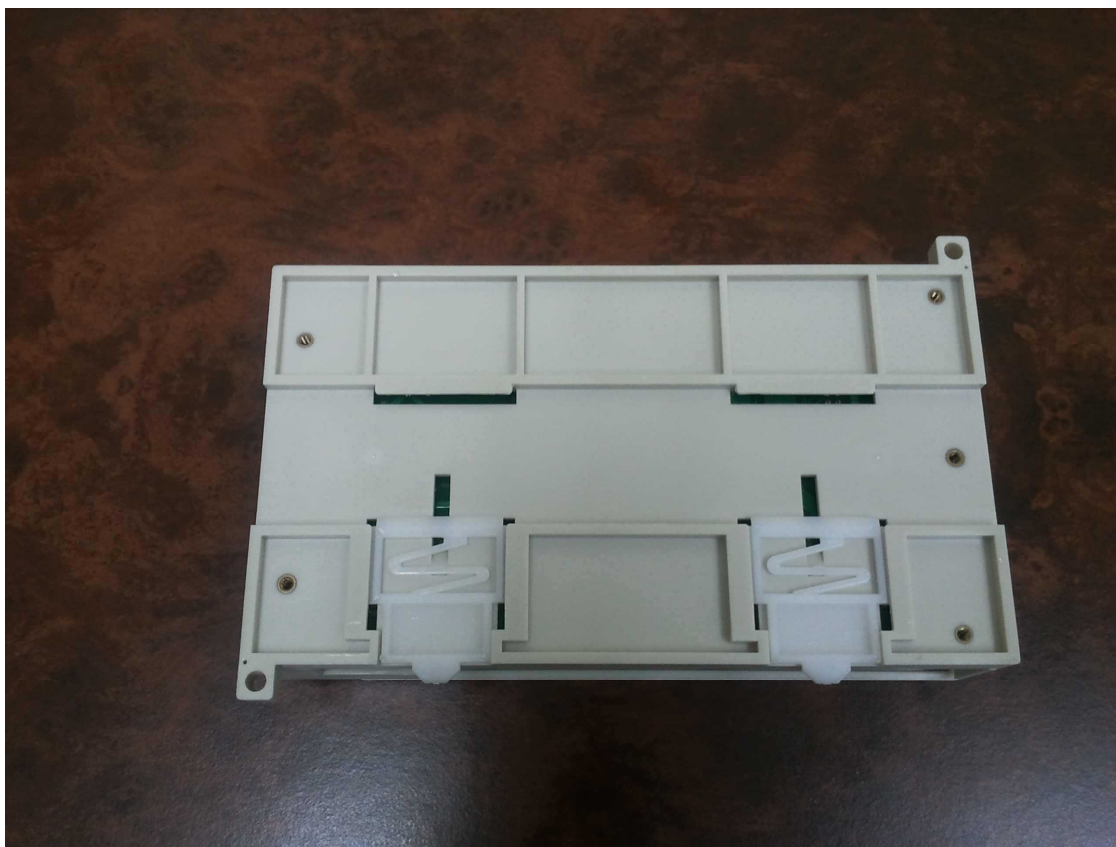


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## **Appendix 2**

### *Hub installation points*





## **Appendix 3**

### Hub -Meter & Valve connection

